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ABSTRACT

This document for secondary school Canadian students analyzes the role of agriculture in the national economy and in Canadian trade, describes characteristics of Canadian farms, and discusses governmental inlfuences on Canadian agriculture. The document stresses that agriculture is a large source of national wealth; about 30% of Canadian farm production is exported, with wheat and wheat flour accounting for half the exports. Characteristics of Canadian farms are discussed in terms of size, what is produced where, specialization of produce, and factors involved in fluctuating prices. Tables illustrate farm sizes from 1951 to 1976, farm cash receipts and expenditures by region, and the value of products sold. Products are classified as: dairy; poultry; livestock; fruits, vegetables, and potatoes; wheat, oats, and barley; and other crops. A discussion of governmental laws, boards, and regulations concludes the document. Involvement of government is described as a result of specialized, large-scale production, farmers' income instability, and the imbalance of market power that exists between farmers and those who deal with farmers. Government programs include: grading, inspection, and health standards; research, extension, and information; crop insurance and credit; stabilization programs; and marketing boards. (KC)

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"Understanding Economics" Series

Understanding Canadian Agriculture

R.M.A. Loyns

The Canadian Foundation for Economic Education is a federally-chartered, non-profit organization. Non-partisan in its approach, the Foundation is committed to increasing an understanding of economic matters, both nationally and on a personal level, through encouraging and assisting with the teaching of economics.

This booklet on Understanding Canadian Agriculture is the fifth of a series on Understanding Economics.

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Preface

One aspect of our lives in Canada, easily taken for granted, is the well-stocked shelves of grocery stores and the abundant food which most of us have on our tables. As a nation, we literally don't know what starvation means. In a world where millions live their whole lives with constant food shortages, Canadians have access to both choice and quantity of food. How has it come about?

The explanation lies in a combination of factors. We have been fortunate that our land is endowed with nearly all the natural resources. We have forests, minerals, water, land and energy. Our climate, while harsh in some areas, is varied and temperate enough for most economic activity. Our population is not so large that it consumes all of its agricultural production to exist. This combination of resources, climate and a comparatively sparse population is the basis for a large and productive agricultural industry in Canada and the reason why we can export food. Japan, for example, also has a productive agricultural industry but has an enormous population requiring imported food to avoid shortages.

These resources would have produced little were it not for the enterprise, hard work and perseverance of thousands of farmers and their families who live on the land in all parts of Canada. As a result of their initiative, we grow an unusually large variety of food and feed products, including grains, oilseeds, fruits, vegetables, livestock and poultry. In fact, we grow nearly everything that will thrive in our climate, and import mainly products needing warmer or tropical growing conditions.

This issue of our "Understanding Economics" series, by Dr. R.M.A. Loyns, deals with an aspect of one of our most essential Canadian industries – primary food production.

Dr. Loyns is Professor of Agricultural Economics at the University of Manitoba where he started teaching in 1968. During the last ten years he has also worked for the Prices and Incomes Commission, the Food Prices Review Board and the Federal Department of Consumer and Corporate Affairs. He is now back at the University of Manitoba where he is pursuing his interest in consumer and food economics and agricultural products marketing.

A later publication in this series will deal with another and equally important stage of food production – processing and distribution.

J.H.P

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Introduction

Among city people, the image of agriculture in Canada is many-faceted. Many people commonly retain a vision of fields of rolling wheat stretching into the prairie horizon. This vision often includes a farm family whose "roots" are firmly planted in the soil, and whose members feel little attraction to city living.

But agriculture also carries with it ideas of complex milk price support schemes and egg marketing boards, and of Canadian grain shipments to China and the U.S.S.R. as a preliminary step toward the diplomatic "thaw" in the early 1970s.

All Canadians probably have some sense of the role agriculture played in helping to shape Confederation. But most city people probably wouldn't guess that the 1976 value of Canadian agricultural production was only a little less than that of mines, quarries and oil wells.

There are many other interesting facts about agriculture that many city people – and perhaps even some farm people – wouldn't know. For example, it's probably not well known that about 25 percent of Canada's foreign aid in 1975-76 was food aid, or that about 10 percent of what we earn by exporting goods comes from agricultural products. Nor would they know that Canada belongs to the World Food Council and the International Wheat Council; and that export negotiations are a matter of high diplomacy and, recently, significant world power.

Agriculture in the National Economy

Most Canadians know about the "Wheat Boom". But, perhaps due to the dwindling proportion of the population living on farms, they don't know much about the current role played by agriculture in the Canadian economy. What is that role, and how has it evolved?

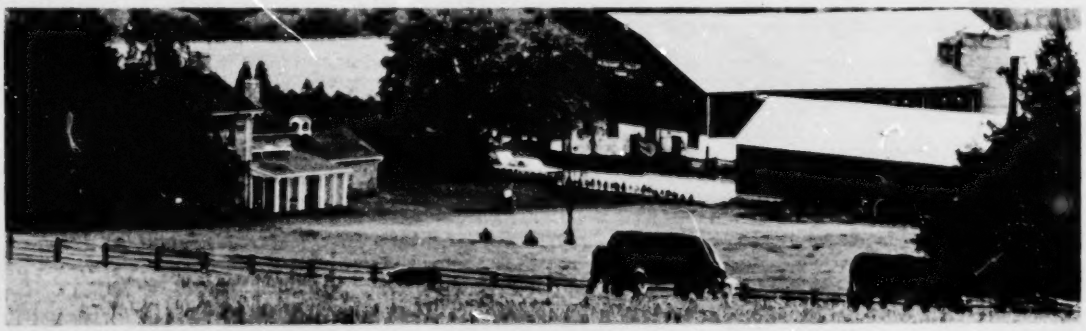
Canada's Gross National Product[1] in 1975 was about $161 billion. Net farm income (i.e., income left after all expenses are paid) in 1975 was almost $4.0 billion, representing only 2.5 percent of GNP. Because agricultural prices and production have been relatively high in recent years (since 1972) this proportion is considerably higher than it was during the 1960s. For example, in 1961, the share of GNP accounted for by net farm income was only 2.1 percent, and 1.8 percent in 1968. It peaked in 1974, a good year for farmers, at 2.6 percent, and declined again to 1.7 percent in 1976. In contrast, wages and salaries of Canadian employees accounted for 56 percent of GNP in 1975 and corporation profits (before taxes) represented 11.5 percent.

Total cash receipts to farmers in 1975 were about $10.0 billion. During the 1969-73 period, they averaged just over $5.0 billion. Much of this increase resulted from increased prices of dairy products, grains, and livestock.

Agriculture is a large user of capital and credit, and the stock of farm resources is an important source of national wealth. The total value of farm real estate, machinery and livestock was estimated to be about $24 billion in 1971, and had risen to $42.5 billion in 1975. Today, depending on the type of farm operation, the capital required to set up a farm can range from $100,000 to $250,000 or more.

[1]GNP measures the dollar value of national economic activity. GNP can be derived by adding up all incomes earned by productive resources (this is called Gross National Product, or GNP). Those interested in learning more about GNP might refer to Statistics Canada, *National Income and Expenditure Accounts, 1961 - 1975*. Catalogue No. 13-201.

Large and small farms on the Canadian scene, representing a capital expenditure of $100,000 to $250,000.



Agriculture in Canada's Trade

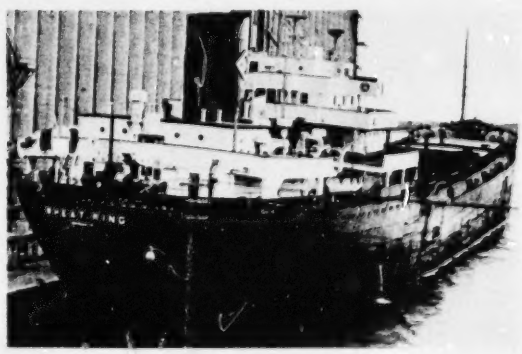
About 30 percent of Canadian farm production (measured by value) is exported. In 1976, we exported about $3.8 billion worth of agricultural products, and half of that was wheat and wheat flour.

Although the U.S. buys about two-thirds of Canada's total exports, only one-eighth of our agricultural exports go to our southern neighbor. No single country dominates purchases of our agricultural exports, and Statistics Canada lists more than 100 countries to whom we sell farm output. Depending on international weather conditions, customers come and go in the food market, perhaps more erratically than in any other market. For example, the combined 1976 purchases of Canadian wheat by the People's Republic of China and the USSR constituted about one-quarter of our total wheat sales. In addition, diplomatic relations among countries influence our exports.

Canada's balance of trade in agricultural products (i.e., the difference between exports and imports) is usually favourable (i.e., more exports than imports). When world cash demand for food is high, as it was during the mid-1960s and from 1972 to 1976, agricultural commodities – particularly grains – are even greater contributors to Canada's balance of payments. Even when the cash demand is lacking, Canada "exports" large quantities of grain in the form of aid.

Grains from western Canada being unloaded at Toronto Harbour. Many Canadian agricultural goods are assembled and loaded in Toronto for export to European countries.

The European Economic Community (EEC) was Canada's leading customer for agricultural exports in 1976. EEC countries bought products valued at almost $900 million, which was 22 per cent of Canadian food exports. Japan bought $780 million worth of agricultural goods from Canada, the United States $570 million, the People's Republic of China $144 million and the U.S.S.R. $360 million.



Characteristics of Canadian Farms

Size

Farming in any country is characterized by a wide range of farm sizes with the majority small. Canada is no exception. There are over a third of a million farm units in Canada, ranging in size from one or two acre strawberry farms on Vancouver Island to one-hundred thousand acre ranches in the Prairie drylands. (Table 1)

In the 1971 Census, there were about 366,000 farms and about 1.5 million Canadians, or 7 percent of the population, living on farms. Most of the farms in Canada are owned and operated by private individuals and their immediate families. It is this latter characteristic from which the notion of a "family farm" is derived. Mechanization has meant that farm sizes have grown, particularly in the last two decades. Consequently the number of farms is declining and large numbers of farm families have joined the non-farm labour force.

What is Produced Where, and Why

Grains and livestock dominate primary food production in Canada, representing more than 55 percent of the value of farm output in 1976. (Table 2) The Prairie region and Ontario account for almost 80 percent of total output. (Table 2).

Most farms are small by industrial standards. One measure of their size is average value of production. (Table 3). Even the large grain or livestock farms today are likely to have annual sales of less than $1 million. There is a large number of very small farms that contribute only a small proportion of total farm output, and a

Table 1

SIZE BREAKDOWN OF FARMS
1951, 1961, 1971, 1976

FARM SIZE	1951	1961	1971	1976
1 - 9 Acres	24,704 (4.0)*	16,734 (3.5)	14,216 (3.9)	6,582 (2.2)
10 - 69 Acres	83,264 (13.4)	50,449 (10.5)	38,611 (10.5)	25,274 (8.4)
70 - 239 Acres	293,872 (47.2)	204,159 (42.4)	127,551 (34.8)	95,772 (31.9)
240 - 399 Acres	102,946 (16.5)	82,626 (17.2)	59,867 (16.4)	51,115 (17.0)
400 - 559 Acres	48,192 (7.7)	44,764 (9.3)	35,821 (9.8)	31,145 (10.4)
560 - 759 Acres	30,821 (4.9)	31,860 (6.6)	28,970 (7.9)	26,452 (8.8)
760 Acres or more	39,292 (6.3)	50,311 (10.5)	61,092 (16.7)	63,778 (21.2)
Total number of farms	623,091	480,903	366,128	300,118
Area in farms (acres)	174,046,654	172,551,051	169,668,614	165,976,260
Average area per farm (acres)	276	358	463	533

*Percentage of total farms

Source: CENSUS OF CANADA – AGRICULTURE – 1951/61/71/76.

Table 2

1976 FARM CASH RECEIPTS AND EXPENDITURES BY REGION

	Atlantic*	Quebec	Ontario	Prairies	B. C.	Canada*
FARM CASH RECEIPTS						
Dairy	$ 71,000	$ 493,225	$ 470,614	$ 176,619	$107,722	$1,319,180
Poultry Products	48,743	193,660	280,685	154,772	84,195	762,055
Livestock(1)	70,547	375,763	957,892	1,411,838	86,847	2,902,887
Fruits, Vegetables & Potatoes	113,066	89,341	260,235	48,537	82,809	593,988
Wheat, oats & barley	48	3,912	88,851	2,532,328	21,362	2,646,933
Other crops	22,261	41,277	589,983	638,897	36,930	1,329,348
Miscellaneous	16,768	162,588	121,672	67,988	51,619	420,635
Total receipts	$342,865	$1,359,766	$2,769,932	$5,030,979	$471,484	$9,975,026
FARM EXPENDITURES						
Wages to farm labour	31,683	$ 69,837	$ 208,364	$ 178,180	$ 53,257	$ 541,321
Fertilizer & crop expenses	37,774	120,609	288,903	448,502	34,834	930,622
Feed & livestock expenses	61,014	327,207	561,222	248,150	101,014	1,298,607
Machinery operation, repair & depreciation	60,306	230,712	497,870	1,316,010	75,631	2,180,529
Building repair & depreciation	24,017	99,775	256,322	229,434	49,676	659,224
Other expenses	35,957	222,230	450,521	860,458	83,869	1,653,045
Total expenses	$250,761	$1,070,370	$2,263,202	$3,280,734	$398,281	$7,263,348

*Excluding Newfoundland

(1) Cattle, calves, hogs, sheep, lambs, other livestock and products.

Source: STATISTICS CANADA – unpublished data

small proportion of farms that produce a large proportion of total output. All of these characteristics are related and more or less predictable. Let us see why.

The climate and soil conditions of the entire Prairie region of North America are suited to grains production. While specific conditions vary according to rainfall, soil, frost-free period and other conditions specific to an area, most cereal grains (hard wheat, barley, oats, rye) and some oilseeds (rapeseed, flax) grow well there. The topography is generally suited to high capacity tillage and elaborate harvesting equipment. Combined with the corn and soybean belt of southwestern Ontario and the mid-western United States, the grains production potential of the heart of the North American continent numbers in the billions of bushels or hundreds of millions of tons per year!

But we are also a continent and nation of meat-eaters. The dryland areas of North America and the foothill regions of the western mountain ranges are suited to cattle grazing, one important step in the production process of cattle. Grain feeding is another important step in fattening or finishing cattle into the kind of beef that Canadians appear to want. Consequently, with the conditions right for grains production, the concentration of demand for meat products in the central region of the country, and the land available for livestock production, the Prairies and Ontario have developed as Canada's major food-producing regions.[2]

The same factors explain the location of other types of production. Fruit and vegetable production are important mainly in southern British Columbia and Ontario because of climatic conditions. Fluid milk production (i.e., milk for liquid consumption) tends to be located near major cities because of the historic problems of transporting milk over long distances. Other dairy production is more likely to be in eastern Ontario and Quebec because of a humid, moderate

[2]These characteristics have developed a particular trade pattern between Canada and the United States in cattle and meats. Population and livestock production are more evenly spread over the United States than they are in Canada. When trade barriers are low as they have been for meats, international trade does not respect international boundaries, and food goes where people need it. As a result, some of our trade in livestock is north-south instead of east-west. This would also occur in grains if the United States and Canada were less protective of their grain producers. There are, however, tariff and non-tariff barriers on grain trade although we do import United States corn and soybeans.

Table 3

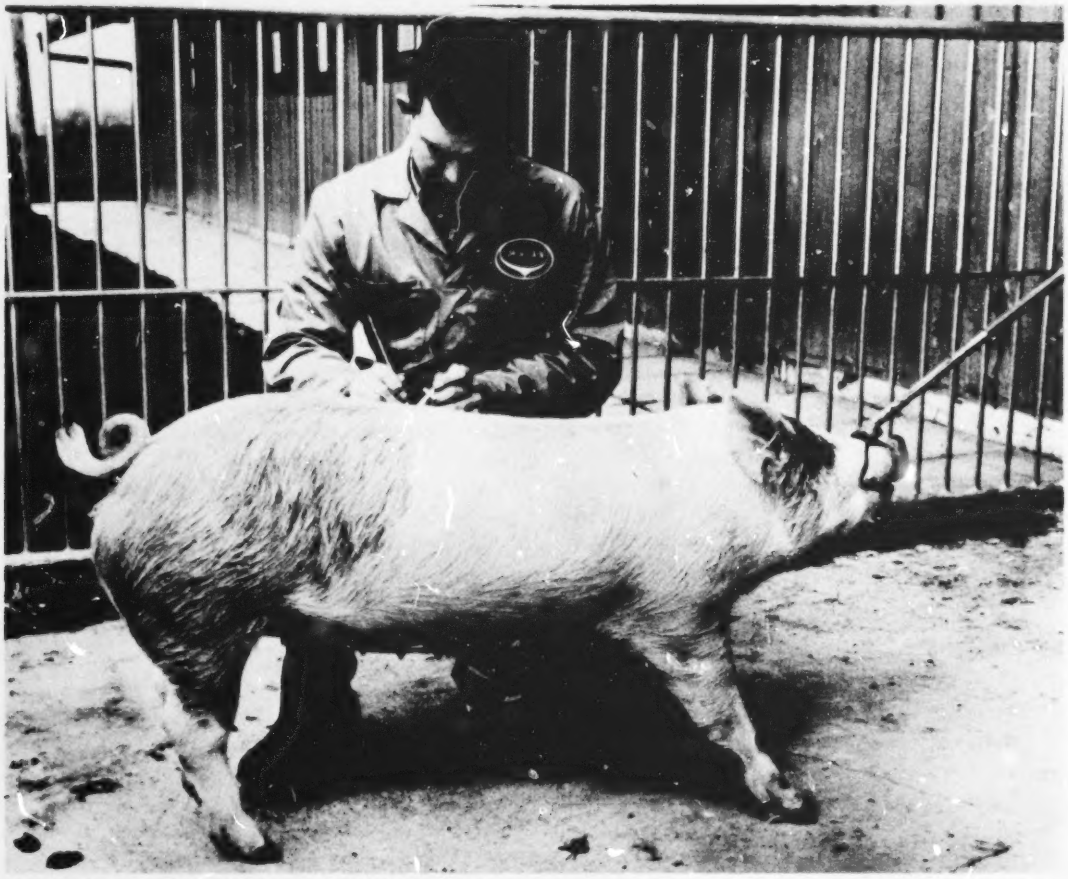
CLASSIFICATION OF CENSUS FARMS[1]

BY VALUE OF OUTPUT – 1976

Value of Products Sold	Number of Farms	Percent of Total Farms
$75,000 and over	21,538	7.2
$50,000 to $74,999	22,120	7.4
$35,000 to $49,999	27,288	9.1
$25,000 to $34,999	32,021	10.7
$15,000 to $24,999	46,129	15.4
$10,000 to $14,999	35,363	11.8
$ 5,000 to $ 9,999	45,791	15.2
$ 1,200 to $ 4,999	69,097	23.0
Institutional farms	771	0.2
TOTAL	300,118	100.0

[1] This term is defined in the 1976 Census as a farm, ranch or other agricultural holding of one acre or more with sales of agricultural products during the year 1975 of $1,200 or more.

Source: 1976 CENSUS OF CANADA – AGRICULTURE – Statistics Canada Catalogue 96-855 SA-5



Bob Robson, assistant manager of the Shur-Gain Research Farm is measuring the depth of back fat on the hog with a depth gauge, to decide whether the hog should go to market or be kept in the breeding herd. Only hogs with a small even distribution of back fat on the shoulders and loins are kept in breeding herds since back fat is hereditary.

climate which favours forage production, and topography that limits other kinds of food production. Agricultural production has not developed in the Maritimes to the extent it has in other areas because of a limited land base and because of the cost of moving livestock feed into the Maritimes. However, there are exceptions such as potato and vegetable production in the Saint John's River Valley in New Brunswick, potatoes in Prince Edward Island, and livestock and apples in the Annapolis Valley of Nova Scotia. Newfoundland has very little agricultural production because of the limited amount of arable soil in that province.

It is important to recognize, however, that almost any area in Canada that can produce small amounts of grass and grain will also have some form of livestock enterprise located there. This is true for northern Ontario, northern British Columbia, the Maritimes, and other areas of Canada.

Over time, changes in production technology alter the place of production and nature of the typical farm. For example, years ago, chicken, egg, turkey, hog and cattle production all tended to be combined into one farm unit, along with grains production if the region were suited. This was the "diversified" farming unit which began disappearing in the 1950s. Today, far more "specialization" is practised where a farmer may produce only one or two types of commodities. Usually, this type of operation will be closely coordinated in terms of resource use or labour availability because it is a highly competitive business. Also farming is as complicated as it is competitive – using chemicals and scientific procedures, complex machinery, large financial resources, and extensive market information.

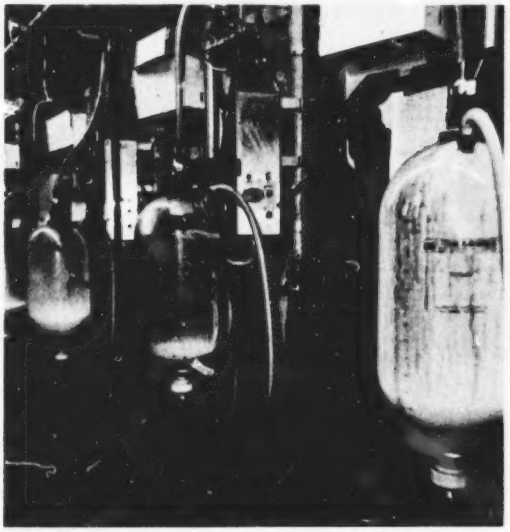
Specialization

All these factors have raised the costs of farming. Attempts to minimize these costs lead to larger-size farms and some degree of specialization that spreads costs over large amounts of output. Consequently, many prairie farmers produce only grain. Other grain farmers may also "feed" cattle but only

during the winter months when they have excess labour freed up from the summer grains operation. Many Quebec, Ontario and British Columbia farmers have specialized hog or poultry operations on a small acreage and produce only a small portion of their own feed needs. Still others have relatively small specialized units which permit (or force) them to take off-farm employment for supplementary income. On very few farms will you see a few pigs, chickens, cattle, and a variety of grain in today's agriculture. If you do, it is likely to be owned by a hobby-farmer, who is not relying on the success of the farm for the family income, and who doesn't have to worry about higher efficiency from better organization and specialization.

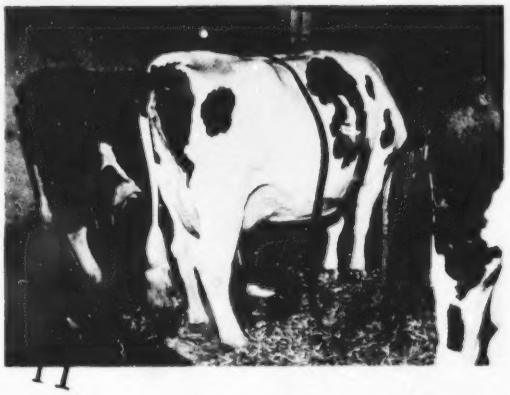
Another contribution to change is the development of technology for mechanizing agricultural production. This is often (incorrectly) referred to as "factory farming" and is sometimes seen as the "unfortunate" end to family farming. However, anyone who has rescued a new-born calf, alive and well, in a snow bank in March, or who has walked through the ammonia stench of a poultry barn, appreciates that mechanization itself does not make farming a factory. In fact, the mechanization of farming began when our narrow-browed forefathers picked up a stick to turn some soil, and it will continue as long as we produce food. In any event, replacement of horses by gasoline and diesel power after World War II, and the technology of closed-housing of animals and birds, accompanied by scientific feeding and disease control, have greatly altered the nature of farm production.

This has meant that one producer could greatly increase his production. It has also meant that the production environment could be more closely controlled, minimizing the dangers of disease and leading to efficiency through standardized farming procedures. This process has progressed furthest in poultry production. That is why production per farmer is highest in poultry. It is also occurring in hog production, and large "feed lots" for beef cattle are becoming common. Mechanical milkers for cows have achieved the same results. It has meant, as well, that production becomes more concentrated close to the larger market areas. This helps explain the rapid growth of egg and chicken production in Quebec since the mid 1960s and significant poultry and hog production on the very expensive land of the Fraser Valley east of Vancouver.[3]



Mechanical milke. s

3. The role of transportation is important as well. About eight pounds of grain per pound of beef is required to "finish" a beef animal, four pounds of grain per pound of pork, and only 2.4 pounds of grain per pound of chicken meat. Consequently, cattle are much more likely to be located closer to grain production than chicken because of the relative amounts (really costs) of feed to produce a unit of meat.



Finally, this development has created the opportunity for non-farmers to become more actively involved in farm production through what is referred to as "vertical integration".[4]

"Family farms" are not typical "small businesses"; as mentioned earlier, the majority of farms are privately-held, family operations. This results in some additional characteristics of Canadian farms which are important to understanding some differences between the economics of agriculture, and of other small businesses.

For reasons explained in the next section, farm produce prices have a tendency to fluctuate widely. The individual farmer cannot influence the price at which he sells – he takes the going price or he does not sell. But by the time the farmer has a product ready for sale, resources have been used up to produce it, and costs have been incurred. Depending on the product, the production process may take years. Some of the costs are postponable, some are not. For example, each year (or each month) the fuel, fertilizer, credit, repair, and living expenses bills must be paid. Over a longer period, machinery, land and labour costs have to be paid – but these costs can be postponed when times are bad (low prices, or nothing to sell), and taken care of in a batch when times are good. Thus, the returns to farm labour and land purchase are called "residual" returns – that is, their value is determined by the amount left over after other expenses have been paid. Because farm prices vary, and output may be up or down because of weather, the farmers' labour return (and profits) are highly variable.

4. Vertical integration refers to the process whereby a businessman expands his operation to provide more of the inputs he requires (backward integration) or to handle the product after it has been produced (forward integration). The common example in food occurs when poultry processors (backward) integrate to produce their own birds and feed. Some retailers produce their own milk and bread (backward integration). Some producer co-operatives integrate (backward) to produce their own fuel, feed and machinery and have their own processing facilities (forward integration).

Moreover, if several good years are anticipated with a large residual available to land and labour, land prices are likely to rise. Conversely, if returns are low, land prices fall back.[5]

This type of business organization – the family operation and private ownership of land – differs significantly from the norm in other industries. In farming, relatively more costs are postponable, including land costs, than if the entire operation were on a "cash" basis. Enterprises in other industries often meet declining sales or falling prices (profits) by reducing output, laying off employees (non-postponable costs) and leaving unused capacity for better times. The adjustment process in business therefore takes the form of: falling profitability, reduced output, unemployment; then recovery. When times turn hard for farmers they may switch products to some extent. But variations in overall amounts produced, resulting from changes in farm market conditions, are not as rapid and common as in the non-farm sector. Nor is the labour unemployment problem the same. Farmers keep on working; they just don't earn much in difficult times.

There is a trend, however, toward farming to be run more like the general business community. Larger-size farm units often mean more rented land and more credit used,

5. Land prices in western Canada move in regular cycles, in relation to the profitability of grain production. For example, they peaked in 1967-68 when grain sales were high, bottomed out in 1970-71 when surpluses were highest, and climbed again into 1976. Machinery sales in western Canada follow a similar pattern. The price of dairy cows and livestock breeding stocks respond in much the same manner.

P.E.I. potatoes

Nova Scotia apples

and are too large for a family to run without hired labour. Many of the costs of the large farm operations are not as easily postponable, and the postponable costs become a smaller proportion of total costs. Production, therefore, becomes more responsive to economic conditions and bankruptcies may become more frequent in prolonged periods of low returns.

Weather and Time are Crucial

More than any other major type of economic activity, farming is dependent on the weather. To complicate this dependency, agricultural production is biological and depends on the balance that is struck, or can be created, between living creatures and matter, and the environment. But biological growth takes time, and the length of time is difficult to alter. Some plants can produce the final product in a few weeks but most crop production requires several months. Hog and egg production take about a year. Beef production can take up to three years. Some tree fruits take five to seven years to grow. As a result, there is considerable "time lag" between deciding to produce and realizing saleable output. During this time period, a great deal can happen to change the wisdom of the original commitment to produce. Also, modern varieties, breeds and production methods have reduced the time requirements for growth, but only by small amounts. For example, wheat used to require one hundred days, now it's ninety-five; broiler chickens are fed nine weeks instead of twelve.

Weather conditions may change the *amount* of production or its *quality*. Weather, combined with the smallness of individual farms resulting in thousands of individual decisions, and demand or supply pressures from outside of Canada, result in farm prices that are inherently unstable.[6]

6. Another contribution to farm price instability is what economists call demand and supply elasticity (responsiveness). Elastic demand or supply means that a *large* change in quantity is associated with a large change in price. Inelastic demand or supply means that a *small* change in quantity is associated with a large change in price. The overall demand and supply for farm products is more inelastic than, say cars or television sets. As a result, a small change in production or in demand can cause large disruptions in price.

All in all, farmers can never be sure whether they will achieve their production and financial goals.

Coping with Uncertainty

Not all farmers respond to this uncertainty in the same way and some responses are hard to figure out at first glance. For example, some farmers adopt a very conservative approach to production. They may establish a production target for several years and attempt to produce the target regardless of short-term price changes or changing economic conditions. They are calculating that *on average, over time,* conditions will favour them. Given the length of time and cost required to get into some food production, this may be a profitable strategy. However, in some years they will be underproducing and in other years they will be overproducing.

Other farmers tend to adjust to changing conditions but *in response to,* rather than *in anticipation of* market conditions. These are the "followers" in farming. They are frequently into production when they should be out, and out when they should be in. This process aggravates the instability problem, reduces the viability of farms that are involved, and tends to waste resources used in farming. But in a volatile market, without perfect information this is often the best they can do.

Another strategy practised by some farmers is to "share the risks" of uncertainty. One way of doing this is by making arrangements with their buyers at the time of the commitment to produce, i.e., in advance of having the product to sell. This is called "forward contracting". A forward contract may be made directly with a buyer, or through the impersonal "futures market". A variation of forward contracting is vertical integration where a supplier or buyer may own or carry some of the costs of farm production.

There are several ways for farmers to adjust to the problems of uncertainty and, naturally, some do it better than others. Those that do are the wealthy and progressive farmers. Many of those who were unable to cope with the high degree of uncertainty are those who were on the 250 thousand farms that have disappeared since 1951.*

Gullies caused by water erosion (top) are little more than an inconvenience in their earlier stages. But left to grow (bottom) they can lead to serious loss of valuable farm land.

*There have, of course, been other reasons for the disappearance of 250 thousand farms in the last 27 years. Agricultural policies in Canada have not been aimed at creating or preserving a small farm, high cost rural peasantry. Other significant factors have been the abandonment of marginally productive land, differences in individual management ability; to say nothing of the initial ownership of better land, bringing with it the security and confidence that initial success engenders.

The Balance Sheet

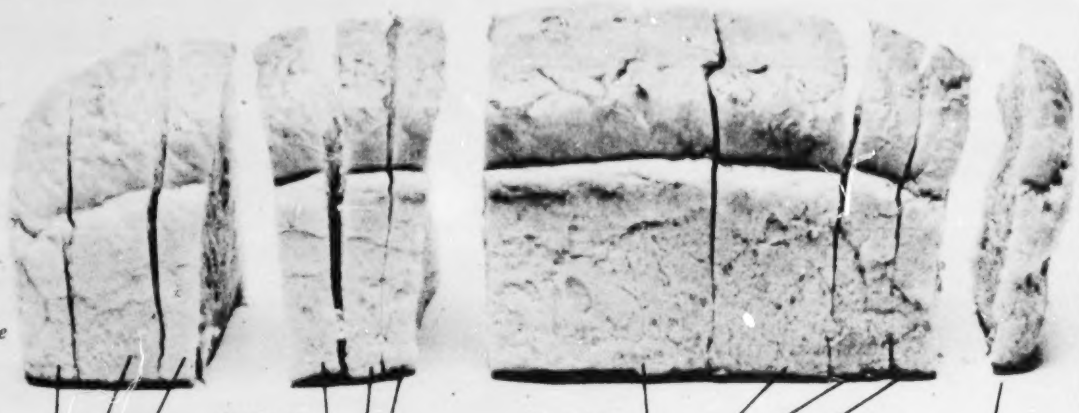
Farmers' overall success in coping with uncertainty is indicated by comparing the cost of inputs used by farmers with their sales. This is done in Table 2, summarized by region. As might be expected, Ontario and the Prairies dominate the cost, as well as the sales, side of agriculture. Farmers in the Prairie region accounted for about 42 percent of total farm expenses; Ontario farmers accounted for over 32 percent. Total farm expenses rose to over $5.0 billion in 1974 (almost $16,000 per farm) providing another indication of how important farmers are as users of economic resources.

The distribution of farm expenses is interesting. During the period since World War II, machinery, fertilizer, chemicals and other aspects of the mechanization of agriculture have become increasingly significant as a proportion of total expenses. As shown in Table 2, machinery expenses are a large portion of total expenditure in all provinces, and are particularly large in the Prairies because of the heavy dependence on large tillage and harvesting equipment used in grain production. For the same reason, fertilizer and chemical costs are proportionately larger in the Prairies. On the other hand, feed and livestock expenses are proportionately larger in Ontario and Quebec because of the *relative* emphasis on meat and milk production in those provinces.

One feature of feed and livestock expenses is that most of these costs represent sales by other farmers. Unlike fertilizer, fuel, or machinery purchases which are from outside agriculture (some from outside Canada), livestock and feed purchases are made from other farmers. This sometimes creates the situation in which livestock farmers have difficult times because their major cost – grain – is large, while grain producers benefit from the high prices. This is part of the reason why beef producers have been squeezed since 1974. On the other hand, livestock producers may be favoured by low grain prices which hurt grain producers. This situation existed during the 1969 to 1972 period. This is also why some farmers still produce grain and livestock. It is also why there is a tendency for resources to shift between the production of grains and livestock in those areas, notably the Prairies, where that is possible.

Energy for food

Here's how much energy – the same as is found in 0.5 kg. of oil! – that is required to produce a 1 kg. loaf of bread. (Data by G. Leach.)



Government Influence on Canadian Agriculture

The position of agriculture in the Canadian economy cannot be understood without taking into account the prominent role played by governments in nearly every aspect of the industry. Few other sectors of the economy are as closely influenced* by government laws, boards and regulations as agriculture.

Historically, government involvement in agriculture originated with the distribution of lands as Canada became settled. Later, both levels of government undertook research, education, training and extension activities.[7] These things were done in order to exploit the economic potential of Canada's food base. Also, the federal government became involved in health standards, grade and trade standards and inspection because agricultural and food products were traded across Canada and in international markets. Today, both levels of government are also involved in various forms of income transfer to agriculture.

Before considering governments' role in the 1970s, let us look at why all of this has occurred. Much of the explanation lies in what has already been said about the characteristics of farms and farming. In the beginning, virtually all of the land area in Canada belonged to the Crown as represented by either the federal or provincial governments. Most land settlement involved farming. Moreover, farms are small units spread over vast areas; government efforts were required to improve communication linkages. In addition, many original farmers were displaced labourers, businessmen, princes and paupers, who knew nothing about farming. Also, even those with an agricultural background had the difficulty of coping with a new agricultural environment in an unfamiliar country and with, initially, ill adapted varieties. To capture all of Canada's agricultural potential, it was early recognized that government research and extension, training and information services were required. Consequently research and extension services at both levels of government were established. Universities, experimental farms, and agricultural vocational schools were set up. The payoff to Canadians generally from these activities is considered to be high. These activities remain an important part of governments' involvement. It is not only coincidence or luck that has made Canadian agriculture among the most progressive and productive in the world.

If all Canadians produced their own food and traded neither with other Canadians nor with foreigners, a high degree of government involvement in agriculture would likely be unnecessary. But specialized large scale production is highly efficient and Canada is well suited to producing food for export. The collection and movement of products within Canada requires a transportation system, which became the responsibility of government early in Confederation. It also requires mechanisms for facilitating trade, i.e., for determining trading conditions, standardizing products (grading), assuring payment mechanisms, defining rights and responsibilities, etc. These things are important to individual traders and to farmers in domestic sales. They are also important to Canada as a country dealing in international trade. The fact that farmers and the other agents in food production deal with biological matter means that sanitation and health standards must be established and maintained. This also requires government involvement.

Income Instability

Another reason for government involvement relates to the variability of farm prices, production and incomes. It also relates to the large number of farmers with small volumes of sales and low incomes. These characteristics of agriculture have received more attention in the last

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* L. R. Rigaux, **"Government Involvement in the Canadian Food System"**, Department of Agriculture Economics, University of Manitoba, April 1974.

7. Extension activities involve trained personnel who work with farmers on their farms to solve particular problems or generally to improve the efficiency of the farm operation.

decade or so. In many respects, the variability has become more intense during this period as well. These characteristics of agriculture have produced government response aimed at stabilizing farm prices, stabilizing returns or incomes, and at improving farm incomes. Taxation and tariff policies are used to some extent for these purposes; stabilization programs, marketing boards, credit and insurance programs are also used.

Balancing Market Power

Finally, governments have become involved in attempts to offset some of the imbalance of market power that exists between farmers and those who deal with farmers. The structure of farming (i.e., the number and size of farms) differs from the structure of food processing and retailing, and from the structure of industries providing farm supplies. The economic agents with whom farmers deal usually have more – often much more – "market power" than farmers.

During the 1920s, farmers organized, and governments promoted, the formation of co-operatives. Co-operatives are a voluntary banding together of farmers into supplying or selling organizations. Farm co-operatives still exist and are important in several kinds of activity (notably grain elevators, fertilizer and fuel in the West, and farm supply and feed manufacturing in the East). But they have achieved limited success in altering the real balance of market power.

As a result, governments have become more directly involved in production and marketing. The federal government and most provinces have agricultural credit agencies, and crop insurance agencies. They also regulate transportation, grain handling and selling. In addition, governments have provided the legislative power to farmers to form marketing boards, thus providing farmers with more market power. Marketing boards are a form of compulsory (contrasted to voluntary co-ops) horizontal combination of farmers[8] with powers to affect certain aspects of producing or selling their products. The number and importance of marketing boards has grown in the past two decades. Today, marketing boards affect, in one way or another, about 75 percent of all agricultural production in Canada.

Following are a few details on some of the general programs mentioned above. Indications of the dollar amounts involved will also be provided. This area is one which itself could occupy several pages. Consequently, the details given here will be sketchy.*

Specific Government Programs

Several federal departments are involved with agricultural and food products. The same is true at the provincial level. However, the respective Departments of Agriculture are by far the most important. For example, of the $1.2 billion federal government expenditure in the food industry in 1972-73, the Department of Agriculture had a budget of $330 million, ($675 million in 1974-75) and the ten provincial departments had a combined budget of about $266 million. In addition to Agriculture, the federal Departments of Consumer and Corporate Affairs (inspection, weights and measures) and Health and Welfare (food safety) are important. Comparable but less significant responsibilities exist in the provinces. In order to outline the role of government as it exists today, we will consider:

1 – Grading, inspection and health standards;
2 – Research, extension and information;
3 – Crop insurance and credit;
4 – Stabilization programs;
5 – Marketing boards.

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* A good source of more information on these programs is Richard Shaffner, **The Quest for Farm Income Stability in Canada**, C. D. Howe Research Institute, Montreal, March 1977.

8. Vertical and horizontal integration are standard terms referring to organization of business, including farming. Vertical integration was defined on pg. 11 Horizontal integration is the combination of several agents doing the same thing into a bigger, stronger unit. A co-operative is voluntary horizontal integration of farmers (or consumers); a marketing board is a compulsory combination of farmers. The notion of marketing boards for consumers is not yet popular!

Inspecting and grading meat

Average per capita consumption of most meats rose in Canada in 1976. The average Canadian appears to have eaten 110 pounds of beef, 53 pounds of pork, 33 pounds of chicken, nine pounds of turkey, five pounds of veal and two pounds of mutton and lamb.

1) Grading, inspection and health standards – Most of these regulations that exist at the farm level, and even at later stages of food production, are the responsibility of the federal government. For example, the grades of beef (which help determine the exact price farmers receive for cattle, help trading between meat packers and retailers, and help consumers decide what to buy in retail stores) are established by a federal beef grader shortly after slaughter. The same is true for hogs, for poultry and eggs, and for processed fruits and vegetables. Imported products also must conform to federal quality standards. Similarly, inspectors (mainly federal) ensure that food products are processed and prepared under clean and sanitary conditions.

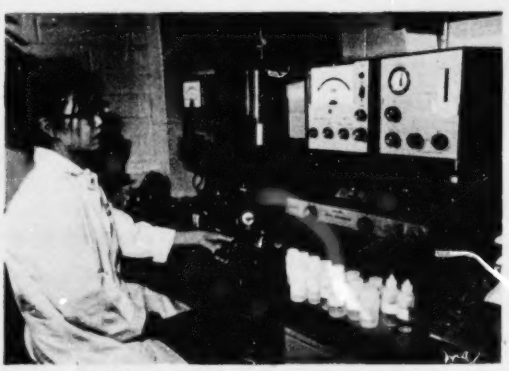
The federal Department of Health and Welfare also has certain responsibilities for food safety. It determines whether food additives, animal or crop diseases, chemical growth stimulants or herbicides and insecticides, etc., pose a health problem to humans. If such factors are considered to be a danger, the Department can issue regulations or prepare laws to prevent their use. The Department of Consumer and Corporate Affairs, and the Canada Grains Commission, are responsible for ensuring that products offered for sale are accurately described, labelled and weighed. These activities are often viewed as bureaucratic meddling. But think of the number of pounds of meat, or grains, that pass over scales each year and of how important a small matter like weight and measurement is to the smooth operation of commerce and to the protection of all players in the food industry.

In fact, all of these considerations are extremely important to our health, our ability to trade, and to Canada's good reputation as a food producer. Tight government surveillance is critically important because of the potential hazards that result from the nature of food and the number of people who are involved in its production.

2) Research, extension and information – Both levels of government are active in agricultural research. The goals of this research range from growing more and better grains, to producing more milk per cow, to improvements in transportation, storage or handling of food. It also covers the economics of food production, and some of the social and environmental sides of agriculture. Agricultural extension communicates the results of this research as well as other information. These activities are important because farm units are small and tend not to generate their own technological change. They will, however, adopt it quickly once it is provided.

Information on commodities is collected and distributed by governments, again because farmers can and will use it but don't have time to collect it. Both Agriculture Canada and Statistics Canada have major statistical networks. The Canadian Broadcasting Corporation, as well as other communications media, have been used as vehicles for distributing information to farmers. As well, the provinces have their own information services. All of these things help to remove some of the problems associated with the uncertainty of farming. They do not, however, remove them completely.

This writer, located in a Faculty of Agriculture at a University, cannot leave this subject without a word on the role of universities. There are agricultural colleges in each of the four western provincial universities, at Guelph in Ontario, at MacDonald Campus of McGill University, and Université de Laval in Québec, and at Truro, Nova Scotia. As well, there are three veterinary colleges in Canada, and vocational or diploma schools at many locations across Canada. These institutions are supported primarily by provincial governments, but also receive funds from the federal government and from industry. They perform three important functions. First, they are a significant component of agricultural and food research. Second, they perform important extension functions. Finally, they are the source of virtually all professionally trained people working in the food industry in Canada. The research scientist, the meat grader, the local veterinarian, the agricultural representative in banks, chemical companies, etc., and government officials dealing in agricultural matters are likely products of this system. More and more, farmers are also trained within the university or college system.



Research at the University of Guelph in Ontario.

3) Crop insurance and credit – The uncertainty associated with farming operations has brought government into agriculture in several ways. We established earlier that a great deal of capital is used in farming – for land, buildings, machinery, livestock, etc. As a result, credit is an essential part of farming. Because of severe financial problems and losses associated with farming during the 1930s depression, credit agencies have been very reluctant to re-enter the farm credit market. Consequently, the federal and provincial governments have helped farmers get credit in two ways. First, they "guarantee" loans to farmers, i.e., they assure a credit grantor that they (government) will prevent the lender from losing seriously on some types of loans. This applies primarily to medium-term credit for machinery and livestock purchases, and for beginning farmers. Second, they have become major direct lenders on land and building loans through government-operated agencies.

Governments at both levels also provide insurance against certain kinds of natural disasters – weather in the case of crops, and certain diseases in the case of livestock. The crop insurance programs (which are shared-cost programs between the two levels of government) limit producer losses from rain, flooding, frost, insect damage, etc. Livestock disease compensation is paid if a farmer is beset by the misfortune of Hoof and Mouth disease, blue-tongue, rabies or several other animal diseases that are no fault of his own.

The overall result of both of these forms of government involvement is to spread some of the risk of farming between the public (through tax dollars) and farmers.

4) Stabilization programs – The variability and uncertainty of farm income has also led to the general category of government programs referred to as "stabilization" measures. These involve the federal government, and in a few instances the provinces, providing funds to assist farmers during periods when product prices fall below a certain specified level. The rationale is that by maintaining producer returns when prices are very low, farm welfare is improved and wide swings in production that help cause variable prices will be reduced.

At the federal level, there are now stabilization programs in place for most of the major commodities. Beef cattle and hogs, as well as several fruit and vegetable crops, have had some support for several years. The amount of support has been increased in the past three years. For example, beef stabilization programs cost the federal government about $40 million in 1976. Individual producers who sold 100 beef animals for slaughter in 1976 averaged about $2,000 from this program. In addition, the Canadian dairy industry receives large amounts of support under this program. In 1975, Canadian dairy farmers received about $282 million, and in 1976, they received considerably more than that. Also, new programs have been instituted in 1976 and 1977 to provide similar assistance to western grain producers and the farmers who produce calves for the beef industry – the "cow-calf" farmer.

There are two aspects of these programs which should be noted. First, they are not really "stabilization" programs in the true sense of that word. Most of these programs operate only to stop *losses* associated with low prices. When prices rise, or reach their cyclical peaks, farmers receive the full benefit of the high prices. In this sense, they are price support programs rather than stabilization measures.

Second, assurance against losses may encourage farmers to maintain production even though prices are low, but such assurance will not necessarily stabilize the domestic market in either price or quantity. If trade with other countries occurs, the amount farmers sell in Canada and the Canadian price will depend on prices outside Canada. Consequently, even though a price support program results in more stable output levels and a price floor for farmers, it may not stabilize prices in the domestic market. Therefore, the often-heard arguments that these programs benefit consumers by providing assurances of supplies and stable prices may not be true.

5) Marketing boards. Marketing boards have become another important form of government intervention. They have also

become one of the most controversial and least understood aspects of farming today.

There are many kinds of marketing boards. The Canadian Wheat Board controls sales of all wheat, oats and barley produced in the Prairies for export. It also controls farmer deliveries and movement of all Prairie grains. It does not, however, directly control the amount of grains produced, and it sells at internationally competitive prices. It has only a limited influence on domestic prices of grains used for livestock feed and the Government of Canada sets the price of wheat used in Canadian bread.

On the other hand, the Canadian Dairy Commission (controlling all milk for manufacturing), the boards which control fluid milk (milk for drinking), the Canadian Egg Marketing Agency and the Canadian Turkey Marketing Agency, operate "supply management" programs and do influence (raise) the domestic price of the products they control.[9] Supply management refers to marketing board attempts to tailor production levels (by means of quotas) and imports to expected consumption at a price level acceptable to producers. In order to assist these boards in regulating supply and prices the federal government places limits on the amount of a product which may be imported. It is primarily the supply management boards which generate the controversy. Consumer advocates maintain that prices to the consumer would be lower if this type of marketing board didn't restrict production.

[9]The CDC regulates the price of milk used in cheese, butter and dried skim milk. Provincial fluid milk boards control milk used in the fresh liquid form, ice cream, yogurt, etc. CEMA influences all egg prices, and CTMA influences turkey prices. In 1977 a national board was initiated to regulate chicken marketing. Consequently, the dairy and poultry industries in Canada have the greatest amount of marketing board control.

Summary

Agricultural production is a big and an important industry in Canada. The value of farm output reached almost $10 billion in 1975 and 1976. Billions of dollars of agricultural products are exported from Canada each year, considerably more than the value of imports. There are more than 350,000 farms, and almost 1.5 million, or nearly 7.0 percent of all Canadians live on farms.

This discussion has attempted to provide some background on Canadian agriculture from an economic perspective. It is hoped that enough information has been conveyed to provide some understanding of farm production. Problems of farming are presented in the media almost every day. The economics of food production affect you every day since food expenditure is as certain as death and taxes.

Canadians are fortunate to live in such a wealthy and food-rich country. It is not, however, a segment of the Canadian economy that we should take for granted, as most of us have tended to do. A clear understanding of the industry, particularly the economics of it, is one of the best means to assuring that we will continue to be well fed, at relatively low cost.

Afghanistan: dried eggs and skim milk powder are sent by Canada

Somalia: Canada provides dried skim milk and wheat flour

Since 1963, Canada contributed food aid valued at more than $400 million in commodities ranging from wheat to canned turkey.

Over 45 per cent of this food aid was made available through such multilateral channels as the World Food Program (WFP), the United Nations Works Relief Agency (UNWRA) and the United Nations Children's Fund (UNICEF). Some 90 of the 100 countries receiving WFP assistance get Canadian food.

Acknowledgements

Page

3. Ontario Ministry of Agriculture and Food

   Canada Packers Limited

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9. Canada Packers Limited – photo by
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10. Ontario Ministry of Agriculture and Food

11. Cartoon by Trevor Hutchings in
    The Financial Post – April 23, 1977

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15. "The Country Guide Magazine" – March 1977

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